CIS Graduate Programs and Employment

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Introduction

There are a variety of views within the IT and business communities of the value of business skills within IT. There are also a variety of views of how to best educate those who will become IT leaders in business. This paper investigates the proposition that there is a growing need for individuals who combine technical and business knowledge.

In the spring and summer of 1995, a research study was conducted to determine whether or not an MBA with an emphasis in Computer Information Systems is relevant to the realities of the current IT workplace. The research was conducted using a survey that was faxed primarily to companies in the greater San Francisco Bay area. Each survey question included a number of items that participants were asked to rate in importance. The survey questions focused on the following areas:

1. **IT Positions** - This question listed 15 positions into which recently graduated MBAs in CIS are likely to be hired. The positions ranged from Business Analyst to Software Engineer.
2. **Computer Knowledge** - This question listed 22 areas of specific computer/technology related knowledge that MBAs in CIS are expected to have to be successful. The knowledge areas included technical as well as analytical skills.
3. **Business Competencies** - This question listed 10 specific business/managerial related competencies that MBAs in CIS are expected to have.

Three types of organizations were targeted for the research study:

1. High tech organizations such as hardware and software manufacturers
2. Large organizations likely to have significant IT needs, e.g., banks, supermarket chains, HMOs
3. Organizations involved in technology related consulting

Literature Review

The majority of recent articles that explore this topic focus on the need for IT professionals to be business professionals as well. While many of these articles focus on higher level management positions, such as CIOs or Information Center Managers, it is apparent that the need to integrate business and technical skills filters down to all levels.

The authors of various articles take diverse approaches to the subject, but their conclusions generally remain the same: It is no longer sufficient to focus solely on technology. IT professionals need to understand the business context in which they work and they need to be able to speak in the language that business people understand. For example, one reads repeatedly that IT people need to be able to explain expenditures in terms of ROI, that IT issues need to be articulated in a way that is understood from a business perspective, and that like every other type of manager, IT managers must understand how to lead and motivate their subordinates.

The review of literature from both academic and popular journals concur that just as IT has become integral to business, individuals who are proficient and understand both business and technology and can function
comfortably in both areas are the ones who are going to best succeed in leadership roles as business becomes even more dependent on technology.

While there is some dissention, the majority of articles support the premise that Schools of Business are the appropriate place for CIS/MIS programs and having these programs within an MBA curriculum allows for better integration of the study of business and technology. With rapidly changing technologies and business environments, schools need to make special efforts to make sure that what they teach is both current and relevant to business. Many schools are trying to change their MBA programs to address the new business/technology issues. The articles reviewed stressed that content and teaching methods must be evaluated when changes are made to MBA programs to make sure that both are optimal for the educational process.

**Survey Results**

Based on the literature review and preliminary investigation, it was hypothesized that there are positions for which an MBA is preferred, and that those positions will tend to be analytical and managerial in nature. It was also hypothesized that employers will place a high value on communication and interpersonal skills, as well as previous experience in a closely related field.

**IT Positions** The first survey question asked participants to indicate the extent to which an MBA in CIS is preferred for IT positions. The ratings for the positions ranged from 1 - "Not preferred" to 4 - "Highly preferred." In general, the highest ratings went to Business Consultants and Business System Analysts. The next highest ratings were for various management positions. The lower ratings went to programming and engineering type positions (Software Engineers and Applications Programmers) as well as Database Administrators and Sales Engineers. These results support the premise that MBAs are more desired for analytical and managerial positions rather than engineering/programming positions where more technical expertise (and a degree in Computer Science) is generally preferred.

**Computer Knowledge** The survey question asking participants to indicate the importance of having specific knowledge and/or skills in a variety of computer related areas yielded mixed results. The ratings for computer knowledge ranged from 1 - "Not important" to 5 - "Extremely important." The highest rated knowledge areas were Systems Analysis, Software Development Methodologies, and Networking.

The majority of the areas of computer knowledge fell into the middle grouping of "Slightly important to Moderately important." Within these areas, the level of importance seemed to depend greatly on the nature of an organization's business, and on the particular nature of the work being done in the area or department of the individual filling in the survey. Within this middle grouping, it is interesting to note that the higher ratings went to relatively newer areas of technology such as Executive Information Systems, Database Theory and Design, Object-Oriented Technology, Decision Support Systems, and Distributed Database Systems. Aside from telecommunication related areas, the lower ratings in this grouping went to older, more traditional, and more technically detailed technologies such as 3GL Programming, Database Administration, and Physical Database Design.

It is difficult to articulate a clear pattern or explanation for the ratings other than by matching the results to current workplace trends and a general understanding of IT and business. With the exception of LAN and WAN networking, the more technically oriented the knowledge, the lower the rating. With the pervasiveness of computer networks, the need to understand LANs and WANs is clear. It also seemed logical that as the areas of knowledge become more technically oriented, such as circuit and packet switching, the less appropriate the knowledge becomes for people who are generally dealing with higher levels of abstraction, e.g., managers and analysts.

**Business Competencies** The survey question asking participants to indicate the importance of a number of general business characteristics and competencies yielded the most conclusive results. The ratings for
Competencies ranged from 1 - "Not important" to 5 - "Extremely important." All of the ratings within this group were relatively higher than within any other group. It was also easiest to categorize and explain the ratings. As with most other studies reviewed, the highest ratings went to the people-oriented abilities of Communication and Interpersonal skills, indicating that these abilities are most important to employers. Work experience in a related field was the third most important competency. Considering that this study was aimed at IT positions, it seems logical that computer related technical skills are also important, but less so than the 3 higher rated competencies. Even the lowest rated competency, general business skills was rated 3.5 - somewhere between "Moderately important" and "Important" emphasizing the overall importance of business related competencies.

**Summary Conclusions**

The survey results and literature review confirm the basic premise that there is a need for people who are proficient in both business and information technology. Within IT, there will always be organizations and positions for which technical and engineering skills are paramount. However evidence supports the position that there are opportunities both within IT and business in general for people who can combine technology and business skills. This combination of skills is becoming increasingly important as:

- more organizations turn to IT to improve business performance and IT become more integral to all aspects of business
- the mode of working shifts to self-managing, cross-functional work teams and responsibility and authority gets shifted down the hierarchy
- individuals move into all types of management positions

As was postulated, current literature and this study confirm that there are positions where MBAs (and strong business skills) are preferred and there are other positions where business skills are not important. There is a significantly higher preference for business skills in managerial and analytical positions, while these skills are generally not desired or required for programming and engineering positions.

**Implications for MBA - CIS Curricula**

Using the material gathered in the course of this research study, there are a number of related implications that can be drawn in regard to the teaching of CIS within an MBA program.

1. The major value in getting an MBA in CIS, as opposed to a more technically oriented degree in Computer Science, is understanding technology from a business perspective and gaining the ability to act as an interface between the two. By approaching the study of technology from a business orientation, MBAs gain a wide range of knowledge that adds to their ability to succeed in a variety of business activities. There are many indications that the ability to function capably in both business and technology is becoming more valuable, and in fact requisite for higher management positions.

1. An MBA must be regarded as just one of many elements that an individual brings to a job. What is learned in an MBA program goes into an individual's "tool-kit," providing skills and knowledge that can be used at varying times throughout a career. An MBA in CIS may or may not help someone get a job upon graduation, but it most certainly will help them as they advance into management and upper management positions, regardless of the area of specialization. This is especially true as IT has become so much a part of all aspects of business.
1. It is not possible for a one or two year educational program to provide the level of technical expertise and experience that employers want for IT positions other than entry level. It must be assumed that students already have or will get the bulk of their technical experience elsewhere. An MBA education can complement or supplement previous experience or it can provide an initial foundation for more technical experience to be acquired elsewhere.

1. With the rapid change that characterizes the world of Information Technology, constant attention must be given to keeping up with those changes. Teaching students specific technologies may be less important than giving students a foundation of underlying concepts while teaching them how to learn about the new technologies that are constantly emerging. It is also important for educational institutions to "maintain a dialog" with the business community to keep up with how businesses are actually using technology.

1. Considering the limited resources that most educational institutions face, every effort should be made to avoid duplication of courses. Especially with the overlap of Computer Science and CIS in technical areas, efforts should be made to work cooperatively so that each department can focus on its area of expertise.

**Study Limitations**

Due to the small size and judgmental nature of the sample selection, the study is likely to be biased.

- Personal judgment was exercised in deciding which organizations to approach, especially when contacting organizations by phone.
- Due to limited resources, the sample size was small -- 21 usable surveys were received. Also, the survey was designed for organizations that have preferences for MBAs in CIS. This greatly limited the number and type of organizations that participated in the survey.
- Of the participants who responded to the initial faxed survey, self-selection bias of those volunteering to participate was a factor.
- The questions were subject to interpretation by respondents based on a number of factors including: Their understanding of the question, the particulars of their organizations, and their position within the organization.
- The nature of each organization and its business functions has a great influence on the types of positions for which an MBA is likely to be hired, as well as the areas of skill and knowledge that are considered to be important.
- The survey focused on short term positions and hiring. Longer term individual growth into higher level management positions was not considered.

References available upon request from first author.